REMARKS

Claims 13 and 14 currently remain in the application. Claims 1-12 and 15-18 have been canceled and no claims are herein amended.

Claims 13 and 14 were rejected under 35 U.S.C. 103 over Mahoney in view of Matsuo and Atsushi. Applicant believes, however, that these references do not properly support the Examiner's rejection for the following reasons.

Firstly, applicant summarizes the main distinguishing characteristics of the present invention as follows:

(1) The thermistor element is obtained by using a thermistor element having principal component oxides containing two or more metals selected from the group consisting of Mn, Ni, Co, Fe, Cu and Al and having a specific resistance lower than 200Ω·cm;

(2) The layer with high specific resistance is obtained from a material having as principal component one or more oxides containing two or more metals selected from the group consisting of Mn, Ni, Co, Fe, Cu and Al and having also at least one metal selected from the group consisting of Zn, Al, W, Zr, Sb, Y, Sm, Ti and Fe; and

(3) The ceramic thermistor element and this layer with high specific resistance are baked together.

Mahoney describes forming a resistive film on the surface of a thermistor element, but this resistive film is merely described as being an insulator or of a dielectric material. Mahoney does not disclose or even hint at using a thermistor element and a high- resistance layer with the same principal component and in particular those having as principal component two or more selected from the oxides of two or more selected from the group consisting of Mn, Ni, Co, Fe, Cu and Al.

Matsuo discloses NTC thermistor obtained by adding Zr and Fe to Mn and Ni as the material for the thermistor but does not disclose or even hint at forming a high resistance layer on the surface of a thermistor element. This means that the idea of forming a high resistance material on the surface of a thermistor element by using the same materials having the same principal component, or the idea of forming the thermistor element and the high resistance layer by baking them together could not have occurred to Matsuo.

Atsushi discloses ferrite and NTC materials as ceramic compositions and ceramic

compound particles having Fe_2O_3 bonded to the surface of ceramic composition (ZrO_2 and $ZrSiO_4$). It is also stated that this material is resistive again corrosion. However, this reference merely discloses ceramic particles themselves with the intention of using them as thermistor element. There is no disclosure of forming a high resistance layer on the surface of a thermistor element, and hence the idea of using materials having the same main component for forming the thermistor element and the high resistance layer could not come about.

The Examiner states that it is easy to use Atsushi's high resistance layer because it has high resistance against heat and corrosion but Atsushi does not disclose any resistance value and hence it remains unclear whether Atsushi's high resistance material has higher resistance than the materials disclosed by Matsuo. If Atsushi's material has lower resistance than Matsuo's material, the plating material may become deposited on the surface of the thermistor element and this would not serve to solve the problem of the present invention or to achieve the object of the present invention. The phenomenon of plating material depositing occurs because the thermistor element is a semiconductor. If electrolytic plating is carried out, the plating material grows not only at the positions of the electrodes but also on the surface of the thermistor element. It is in order to prevent this from happening that a high resistance layer with resistance higher than the thermistor element is provided. The cited references do not mention or compare resistance values of a thermistor element and a so-called high resistance layer. Thus, it is meaningless to cite Matsuo and Atsushi independently or to combine these references neither of which undertakes to single-handedly mention or compare resistance values of a thermistor element and a resistor material.

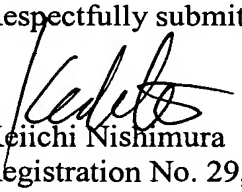
Mahoney discloses formation of a resistive layer on a thermistor element but there is no exact disclosure of the resistive layer to be formed on the surface of a thermistor such as a material of what kind should be used for the purpose. In other words, Mahoney is no different from the prior art technology of forming a glass layer on the surface of a thermistor element described as the background of the instant invention.

The present invention represents a further progress from what Mahoney discloses, based on the characteristic limitation that the resistive (high resistance) layer comprises an oxide of two or more kinds selected from the group consisting of Mn, Ni, Co, Fe, Cu and Al such that its principal component is the same as that of the thermistor element and that they are baked together as a result of which a close and intimate bonding can be obtained.

Based on this technological idea, the present invention still further requires that at least one selected from the group consisting of Zn, Al, W, Zr, Sb, Y, Sm, Ti and Fe should be added to the aforementioned principal component (that is, an oxide with two or more selected from the group consisting of Mn, Ni, Co, Fe, Cu and Al). The cited references each disclose only isolated elements of the present invention but there is no convincing reason to believe that there was any motivation for combining these isolated teachings because none of the cited references discusses the problem to be solved by the present invention and hence none of the cited references specifically states the reason for selecting the kinds of materials to be used for the resistive layer with respect to the material used for the thermistor element.

It is therefore believed that the cited references do not predicate the rejection by the Examiner even if considered in combination, and that application is allowable. Such action at an early date is earnestly solicited.

Respectfully submitted,



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